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was varied with the optical wedge. At 18.25 feet, the result was 15 per cent, certainly greater than at 19.0 feet; and finally, at 19.5 feet, no fringes whatever could be observed from the interferometer mirrors. There was no bright star in the immediate neighborhood that could be used as a check, but the instrument was known to be in adjustment for the final measure from the certainty with which the previous settings had been made.

The separation of the mirrors for disappearance of the fringes may therefore be placed at 19.5 ± 0.5 feet, altho observations with a longer beam with which the second maximum could be observed, might possibly increase this value a trifle. By disregarding any possible darkening at the limb, the result will serve to indicate the maximum diameter of the star. The spectrum of α *Bootis* is Ko; its approximate effective wave-length may therefore be taken at 5.6×10^{-5} cm, about half way between that of the Sun (Go) and that assumed for α *Orionis* (Ma).

With this value of λ and a distance of 19.5 feet (594cm), the angular diameter of α *Bootis* is $0''.0237$. It is interesting to note the close agreement of this figure with the estimated values of Eddington ($0''.020$) and Russell ($0''.019$), and with Hertzsprung's value ($0''.026$) calculated on the basis of the measured diameter of α *Orionis* ($0''.045$).

Results for the parallax of α *Bootis* are as follows: Yale, $0''.074$; Flint, $0''.095$; Yerkes, $0''.100$; Adams, spectroscopic, $0''.158$; the weighted mean is $0''.116$. The distance of *Arcturus* is therefore of the order of 1.65×10^{14} miles (2.65×10^{14} km), and its linear diameter 19×10^6 miles (30.6×10^6 km), or about 22 times the diameter of the Sun.

All settings of the mirrors have thus far been made by hand, and considerable time is consumed between measures. Two screws are now being mounted on the beam, driven by a single motor, which for any separation will keep the outer mirrors equidistant from the fixed inner mirrors and thus greatly facilitate the operation of the interferometer.

F. G. PEASE.

NOTE ON THE SPECTROSCOPIC BINARY, ρ VELORUM

In a list of radial velocities secured at the Royal Observatory, Cape of Good Hope, and published by Dr. Joseph Lunt¹, six values

¹*Ap. Jour.* 50, 161, 1919.

appear for the spectroscopic binary ρ *Velorum*, the elements of whose orbit have been derived by the writer², from plates obtained at the D. O. Mills Observatory, Santiago, Chile. Five out of the six show fairly satisfactory agreement with the computed velocities. The value given for the plate of 1909 February 22nd could not be fitted to the velocity curve. In answer to a letter calling attention to this one discordant observation, Dr. Lunt replied that a mistake in sign had occurred in reducing the measure of this plate with the Hartmann spectrocomparator and this had resulted in giving +16.6 km./sec. as published, instead of the correct value, -39.0 km./sec. In the following table will be found the dates, velocities, phases and residuals for the six spectrograms referred to. Dr. Lunt derives a systematic correction +0.5 km./sec., in the sense Chile *minus* Cape, and this has been allowed for in the residuals O-C, but has not been applied to the velocities themselves.

TABLE
OBSERVATIONS OF THE RADIAL VELOCITY OF ρ VELORUM
ROYAL OBSERVATORY, CAPE OF GOOD HOPE

Date	G.M.T. h m	Phase d	Velocity km./sec.	O-C km./sec.
1909 Feb. 22	12 8	0.36	-39.0	-8.2
1915 Mar. 5	7 57	6.83	+39.8	+6.3
25	8 15	6.42	+39.9	+4.6
31	9 30	2.26	+32.5	+3.4
1916 May 1	7 11	0.94	+2.5	-0.1
May 20	6 8	9.68	-27.1	-1.4

Except for the first one the residuals fall within the range of values found for the observations from which the elements were derived. The time of mid-exposure for this discrepant plate is so close to the time of periastron passage that some uncertainty may reasonably be expected in an orbit with so large an eccentricity (0.54), because of slight inaccuracies in the elements and because the rapid change in velocity at this time may render the measurement of the spectral lines considerably less accurate. Hence its somewhat larger residual need not be a matter of surprise.

R. F. SANFORD.

TWELVE NEW PLANETARY NEBULAE

The following new planetary nebulae were found on plates taken with a 10-inch Cooke Astrographic Lens, 45-inch focus, with ob-

²L. O. B. 9, 181, 1918.